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OF

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COMMUNICATIONS

AN UNUSUAL CASE OF RENAL RETINITIS

BY

R. FOSTER MOORE, O.B.E., F.R.C.S.

WITH PATHOLOGICAL REPORTS BY

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AND

HUMPHREY NEAME, F.R.C.S. PATHOLOGIST AND CURATOR TO THE MOORFIELDS EYE HOSPITAL

THE following case of renal disease with retinitis seems to be worth publishing in considerable detail, on account of its unusually interesting course and the completeness with which various examinations have been possible.

Briefly, it is the case of a man, who, at the age of 45, was ill for the first time in his life, and who then sought advice for failing sight which was found to be due to renal retinitis. The retinal changes were so severe as to produce detachment of the retina in each eye.

In the course of months the retinitis subsided, the detachments disappeared, and he was exhibited at the Congress of the Ophthalmological Society in 1915 (*Trans. Ophthal. Soc., U.K.*, 1915, XXXV, 159), with a coloured drawing of his fundi at that time, showing a retinitis which was well advanced towards subsidence, with a partial atrophy of the disc and a complete absence of retinal detachment.

From this time on he continued at his work at a " Small Arms " factory, at times doing seven days a week of 80 hours, and seven years later he was admitted to St. Bartholomew's Hospital where

he died. Thus, in addition to a closely followed clinical course and repeated ophthalmological examinations, a complete examination of the body was made, and a complete histological examination of both eyes.

The following details are abstracted from my full notes made at each visit.

The dates refer to the period that had elapsed since he first came under observation.

W.C., aged 45, first attended the Moorfields Eye Hospital on May 2, 1913, under Mr. Herbert Fisher, on account of failing sight. He stated that until six weeks before this date he never had had a day's illness in his life.

Five weeks ago he noticed that his sight was defective, and about the same time had headaches, nausea, and pain in the back.

He said he had never had syphilis or scarlet fever.

His urine was of a specific gravity of 1,014, and contained much albumen.

His systolic blood pressure was 215 mm., he had no oedema. He was examined by Dr. James Taylor, who reported: "Heart hypertrophied and dilated, probably sclerotic kidneys."

Mr. Fisher, knowing of my interest in him, was good enough to transfer him to my care.

After eleven days. The eyes were normal except for the fundus changes, his visual acuity was R. 6/36, and L. less than 6/60.

Ophthalmoscopic examination

Right eye. The disc was swollen and the edges much obscured; there was copious retinal exudate over the central region; it was not arranged in the form of a star figure; the veins were engorged and were much cut into where they were crossed by the arteries.

Left eye. There was much massive exudate which obscured the vessels in places, the changes did not differ essentially from those present in the right eye; in each retina a number of haemorrhages were present.

There was a rather small retinal detachment below in each eye.

After three weeks. The veins were very dark, distended, and tortuous; there was more exudate which now tended to form a coarse-textured star figure and was becoming conglomerate.

The blood pressure was 205 mm., the urine was unchanged; the retinal detachments were present as before.

After five weeks. At this date, before examining him myself, I asked Mr. Fisher to see him, who sent a note saying, "I agree to the detachment in the right eye, but I cannot see one in the left," and on examination it was evident that the detachment had gone from the left eye.

After eight weeks. There was now no detachment in either eye, but otherwise one could not appreciate any essential difference since last time.

After four months. R.V. 6/36, L.V. 2/60.

His general health had improved, his blood pressure was 235 mm. The fundus changes were still profuse, but now for the first time one could be sure that the veins were less engorged and were becoming craggy in their contours, the first sign of subsidence of the retinitis.

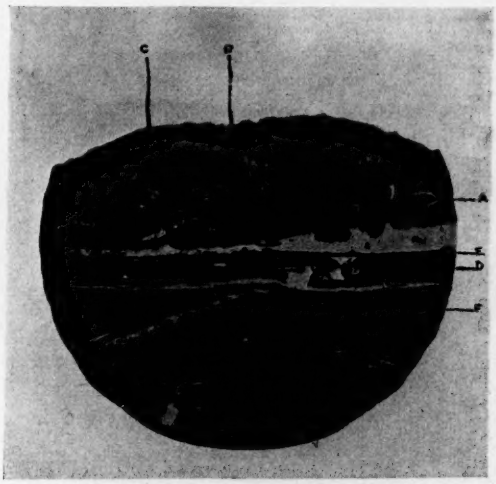

FIG. 1.—The retina near the disc showing:—

(A) Two small masses of retinal exudate in Henle's layer.
(B) The base and (C) the apex of the pigment process in the rosette.
(D) Choroid.
(E) Pigment epithelium.
(F) Sclerotic.

There were no detachments to be seen, and there was no recurrence of them up to the time of death (see Mr. Neame's report).

After five months. There were now marked evidences of subsidence of the retinitis. All the vessels, both arteries and veins, were much reduced in size, the veins had white lines along them for a considerable distance from the disc, and in one or two places the arteries showed "pipe-stem sheathing."

The discs were becoming pale and hazy edged and were taking on the characters of a secondary optic atrophy.

After six months. For the first time at this date the small

angular pigment spots which have been figured by Liebreich (Atlas *Tab. ix, Fig. 1 and 2*), and described by Nettleship (*Trans. Ophthal. Soc. U.K.*, 1899, XIX, 63) were noticed towards the periphery.

The veins now showed well the irregular craggy bends instead of full curves, such as one sees when greatly distended veins later become reduced in size.

After seven months. He is now extraordinarily improved in health.

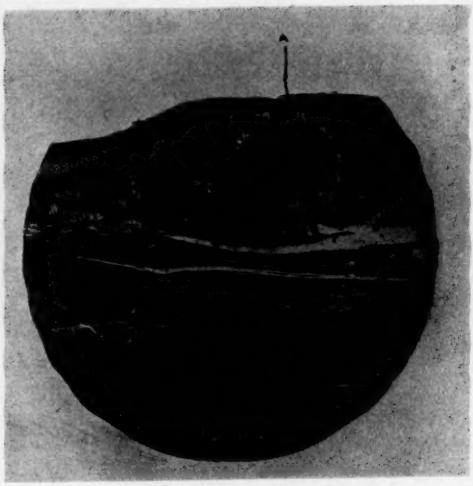

FIG. 2.—Showing (A) the main part of the pigment process in the form of a loop.
Outlying pigment cells lie close to the anterior surface of the retina.

Right eye. All the fundus changes are retrogressing and the exudate is becoming powdery in appearance; there are still a few haemorrhages and patches of more solid exudate.

Left eye. In this eye all the exudate is of the fine powdery type, there are no solid masses; the pigment spots are unchanged, they are more circular than those depicted by Liebreich.

After eight and a half months. R.V. 6/24, L.V. 3/60.

His health is improving, there is a haze only of albumen in the urine, the blood pressure is 220 mm.

The exudate is less, there are three or four haemorrhages only.

After ten months. R.V. 6/36, L.V. 6/60. Blood pressure 210 mm.

After eleven months. Right eye. The disc is pale and hazy

edged as before, and the vessels are very fine, the rest of the fundus in general is normal, except for the fine powdery exudate which is much less than in the drawing previously made by Head.

Left eye. The disc is pale and the edges are indefinite, but are becoming sharper; I can find one haemorrhage only.

There is still a very little powdery exudate within about a disc's breadth of the yellow spot, and the rest of the fundus is nearly normal.

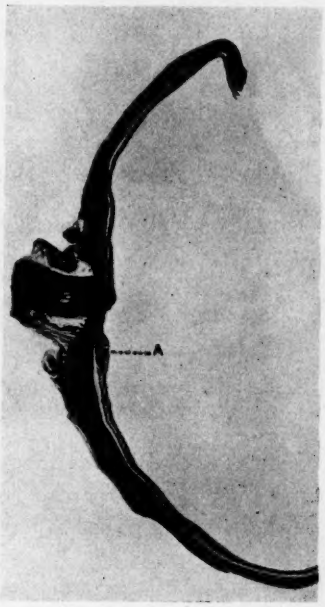

FIG. 3.—A vertical sagittal section of the posterior half of the left globe showing complete absence of detachment of the retina.
(A) Pigment mass.
Section between the plane of those shown in Figs. 1 and 2.

There is the very faintest trace of albumen in the urine.

After fifteen and a half months. He is still doing well, the vision is 6/18 and 6/60, the blood pressure is now 190 mm., and there is not a trace of albumen in the urine.

After nineteen months. The only change in either fundus now, besides the signs of secondary atrophy and the very attenuated vessels, is a very little exudate.

After seven years. Here is a gap of five and a half years during which I did not see him. He was, however, working overtime,

for the greater part of this period in a " Small Arms " factory; I was greatly surprised when one morning he came up to my desk, I had expected he was dead years ago.

He expressed himself as being very well except for a cough. His vision was 6/18 and counts fingers, his blood pressure was 265 mm., and he had a heavy cloud of albumen in his urine.

The fundi were but little altered since last he was seen, there was not a trace of exudate, there were no haemorrhages; for the rest the discs had the characters of secondary atrophy, and the vessels, especially the arteries, were very attenuated. A few weeks later he was taken ill, and was admitted to St. Bartholomew's Hospital under the care of Dr. J. H. Drysdale; he died a few weeks later in uraemia.

I last examined him ophthalmoscopically the day before he died. A complete post mortem examination and a histological examination of the kidneys was made by Dr. Geoffrey Evans whose report is attached.

I removed both eyes entire. They were placed in Zenker's fluid and were thoroughly examined by Mr. Humphrey Neame, Pathologist and Curator to Moorfields Eye Hospital, whose report is also attached.

Remarks

It is not often that one is so fortunate as to be able to trace a case of this nature from within six weeks of the first symptoms of illness, up to the time of death, and then to obtain so complete an examination. The features that seem especially worthy of amplification and comment are: the length of time of survival after the development of renal retinitis, the retinal detachments and their disappearance, the subsidence of the retinitis as watched with the ophthalmoscope, and the pathological findings both in the body generally and in the eyes.

The long accepted formula is undoubtedly true, that few patients live so long as two years after the discovery of renal retinitis. Thus Belt (*Jl. Amer. Med. Assoc.*, 1895, XXV, 735) found that of 419 patients, 6 per cent. lived longer than two years and 65 per cent. died within a year, and many other statistics are available which are in general agreement with this.

There are one or two groups of cases in which it is notorious that the prognosis is much less grave, as in the nephritis of pregnancy, and probably in " trench nephritis."

This patient, however, seems to have been a case of chronic mixed nephritis, and his heightened blood pressure when first seen, 215 mm., seems to indicate a nephritis of some long standing.

The retinal detachments. Retinal detachments in severe renal

retinitis are by no means rare if they are expressly looked for up to the time of death : I was able to find thirteen cases in two and a half years at St. Bartholomew's Hospital (*Royal Lond. Ophthal. Hosp., Moorfields, Reports,* 1916, Vol. XX, p. 262).

They occur most frequently in cases where there is much retinal exudate, and are especially common in pregnancy cases.

They are, I believe, always bilateral, and involve the lower part of the retina, and if the patient survives they are probably always recovered from.

I have seen the sub-retinal fluid completely absorbed within eight days of its discovery.

Apart from pregnancy cases the prognosis is especially bad, for detachment occurs almost exclusively in those cases in which the retinal changes are severe.

Subsidence of the retinitis. Seeing that retinitis precedes death in nephritis for varying periods, but in general for a short time only, there are comparatively few cases in which it is possible to trace the gradual disappearance of the retinitis to a point at which it may be said to have completely subsided.

Nevertheless retinitis runs a definite course; it increases in severity till an acme is reached, and afterwards as subsidence sets in, retrogressive changes take place until all signs of active disease are gone, and a varying degree of secondary retinal and optic nerve atrophy is left.

During the progressive stage, individual patches of exudate and haemorrhage become absorbed in a few weeks, but fresh areas appear and so the picture is maintained. Discrete spots of exudate may become confluent and so give rise to massive areas, but there comes a time if the patient survives, when absorption is in excess of fresh formation, till no fresh changes occur; thus it may happen at the time of death that retinitis is in its early stage, or at its acme, or well advanced towards subsidence.

The first sign of subsidence is a reduction of the turgid condition of the vessels till they ultimately are smaller than normal instead of being engorged. The veins make short craggy bends instead of full curves, the appearance suggests that they have been so greatly, and so long distended that their resilience is impaired, and so they have become permanently stretched; they often have white lines along them.

The arteries become greatly reduced in calibre and may show " pipe-stem sheathing " which, however, afterwards disappears in spite of its solid look.

The exudate becomes less in amount, and it is very characteristic that its remains are of a fine white dusty or powdery appearance, and in this condition it remains for long.

The pigment spots already described may be found in scanty numbers, chiefly some distance away from the central regions. I have seen one of these spots which seemed to develop out from a preceding area of white exudate.

In the present patient at the end of a year the signs of active changes had largely gone, and at the end of seven and a half years, that is one day before his death, the signs of a well-marked secondary atrophy of the nerve and retina were present, there was not a trace of exudate and no haemorrhages: it was clear that the retinitis as such had long ago become completely obsolescent; it was remarkable how little histological change was to be found in the retina (see Mr. Neame's report). There were no signs of the previous retinal detachments (Fig. 3).

It is a point of considerable interest to enquire whether a retinitis, once subsided, can recur should the nephritis become recrudescent.

There is some evidence to show that an eye which has been the subject of serious pathological processes of any kind, is, by this means, protected against the occurrence of retinitis in nephritis.

Thus Nettleship reports a case in which one eye only was affected, the other being blind as a result of thrombosis of the central retinal artery, and a unilateral case in which the unaffected eye was highly myopic (*Royal Lond. Ophthal. Hosp., Moorfields, Reports,* 1903, XV, 340). I have seen a similar case.

With regard to the present case, very few patients die in uraemia without some fundus changes, and I feel no doubt that he would not have died in the manner he did without developing retinitis, had not his eyes been protected against its occurrence as a consequence of the atrophy following the previous disease.

Dr. Geoffrey Evans's Report

W.C. died 15/11/20, post-mortem 16/11/20. Dr. Drysdale. Post-mortem book 1920, Vol. XLVII, p. 212.

P.M. Diagnosis.—Uraemia; chronic mixed nephritis; arteriosclerosis; nutmeg liver; oedema and infarction of the lungs.

External appearances.—Wasted and pale.

Head and neck.—Brain normal; arteries at base showed slight patchy nodular sclerosis in basilar and vertebral arteries, and a similar lesion was present to a more marked extent in the branches of the middle cerebral arteries.

Thorax.—Lungs engorged and oedematous; patchy pleurisy over both lungs and numerous adhesions, old and recent. Massive oedema of left lower lobe. Multiple infarction of both upper lobes, areas chiefly superficial and size varying between a walnut and a pea. Brown induration marked.

Heart.—No pericarditis; petechial epicardial haemorrhages. Mitral orifice admits three fingers; marked hypertrophy and dilatation of left ventricle; dilatation and slight hypertrophy of right. Patchy sclerosis of both mitral and tricuspid valves. Aortic and pulmonary valves normal. Heart muscle firm, not fatty.

Aorta and vessels.—Ascending aorta normal except for plaques of sclerosis in the sinus of Valsalva. Sclerosis of transverse arch increasing in descending thoracic aorta to a coalescing sclerosis of advanced degree showing hyaline areas of degeneration (slight), fatty areas of degeneration (marked) without obvious calcification. All vessels showed medial hypertrophy.

Abdomen.—Peritoneum normal. Stomach and intestines *nil ad rem*.

Liver.—Nutmeg.

Spleen.—Firm and fibrous, tiny arteries stand out prominently.

Suprarenals.—Very marked hypertrophy.

Kidneys.—Right showed a depressed scar opposite the pelvis and other small scars on the surface. Both had a mottled colour, purple, with paler areas. The capsule was adherent to the perirenal tissues and adherent to the renal cortex; it was thickened and split on stripping leaving a coarsely granular surface in which the depressions were a deep purplish colour and the granules pale. On section firm; the cut surface—cortex reduced, confused structure, pale in comparison with the pyramids. Pelvis increased in size and congested. Vessels thickened and showed obvious sclerosis.

Mr, Humphrey Neame's Report

W.C. Post-mortem November 16, 1920.

Macroscopic examination. The eyeballs were both fixed in Zenker's fluid. The *right* was divided horizontally immediately below the disc, but including in the lower half the greater part of the stump of the optic nerve apart from the disc. The upper half is embedded in celloidin, the lower half is in 4 per cent. formaldehyde.

The lower half of the right eye shows a cornea of normal appearance, opaque from fixation, and anterior chamber measuring 2.5 mm. between the pupil margin and the posterior corneal surface immediately opposite to it. The angles of the anterior chamber are well open. The iris and ciliary body appear normal. The lens is of normal appearance apart from slight tearing of the posterior capsule. The vitreous cavity contains a veil-like grey-white substance behind the lens and ciliary body, but behind this narrow zone the main part of the space is perfectly clear.

The retina is *in situ*, and there is nothing to suggest that there had ever been any retinal detachment. The choroid is *in situ*, and there is no apparent exudate external to this structure, or between it and the retina. The sclerotic is of normal appearance.

The left globe is also in two halves, divided in the equatorial plane or slightly anterior to this. The anterior half viewed from behind shows lens, ciliary processes, anterior part of retina and choroid *in situ* and of normal gross form and structure. The posterior half is embedded in cellodin. Division of the latter parallel to the sagittal plane, between disc and macula, shows, on the cut surface, sclerotic, choroid and retina of usual appearance and with no sign of detachment or of exudate or coagulum between the layers.

The macroscopic examination of the right and left eyeballs, therefore, shows no trace of retinal detachment.

Microscopic examination. Sections stained with Ehrlich's haematoxylin and with eosin, or with Weigert's iron haematoxylin and van Gieson stain.

Right eye. The cornea, its epithelium, membranes of Bowman and Descemet and its endothelium appear normal. The canal of Schlemm is patent, the anterior chamber of moderate depth and its angles are well open. The iris, ciliary body and lens show normal structure. Nothing is seen in the vitreous cavity. The retinal pattern shows slight changes. There is some cystic degeneration of the anterior part, and a granular and fragmented appearance of the rod and cone layers in parts of the sections. In some places this appears to be due to oblique section of this layer. The superior nasal and temporal retinal arteries, cut transversely at the disc, show unusually thick walls. Thorough examination of all the sections cut, reveals no trace of exudate in the retina of this eye. The retina is *in situ* except for the very slight separation that so frequently takes place during the process of dehydration and embedding. The choroid shows a few colloid bodies on the membrane of Bruch. Many of the vessels of this layer are unusually thick walled, otherwise the choroidal structure is normal. The sclera and conjunctiva are normal.

Left eye. Posterior half. In general the microscopic appearance of the structures in the posterior half of this eye is similar to that of the right. There is no pathological detachment of the retina.

A few of the sections which pass vertically through the papilla and optic nerve show, in some one, in others two, globules of exudate in Henle's layer. They are situated at about one and a half disc diameters from the edge of the papilla. These globules lie in small spaces within this layer, as though either they had become shrunken in preparation or they had undergone a process

of partial absorption and that the surrounding fibres of Henle's layer had not, so far, regained their normal position, or had disappeared. The globules show a mauve colour from retention of both haematoxylin and eosin. They have a finely granular and fibrillated structure.

A small portion of the posterior region of the globe, including the nasal margin of the disc was re-embedded by Jordan's photoxylin-paraffin method, and of this a series of particularly thin sections was thus obtained. These sections show in places a condition of the rod and cone layer similar to that already described for the right eye, but to a slighter degree. There is also a vacuolar condition of the outer reticular layer. In the latter, formed by the fibres of this layer, there are many irregular polygonal spaces with a diameter equal to that of from two to four of the nuclei of the outer nuclear layer.

A peculiar pigmentary change is to be observed in the portion of the retina which lies between the disc and the globules of exudate already mentioned. In a series of consecutive celloidin sections there can be traced a mass of pigment cells which arises from the pigment epithelium layer and extends forwards apparently to push the adjacent retinal layers in front of it and to invaginate them into the anterior layers. Where this pigment cell mass arises from the epithelial layer the latter is in most of the sections continuous, and in close apposition with the choroid. The mass of pigment appears to be a finger-like process which describes an arc, of which the extremity comes to lie at about the middle of the thickness of the retina, but nearer to the disc than its base. The retina in this area is almost double the thickness of that in the surrounding region. The pigment process, at the cross-section near its extremity is surrounded by a ring of rod and cone nuclei, external limiting membrane and rods and cones, in the form of a large rosette. The rod and cone ring is innermost, and immediately surrounds the pigment. This seems to indicate that, as the pigment cells proliferated and grew forwards they pushed the layers of the retina in front of them. Much pigment proliferation has occurred in the surrounding retina, so that there are many isolated pigment masses. Some of these pigment masses have passed forwards into the nerve-fibre layer, and one is within about 20 micro-millimetres of the anterior limiting membrane. There are many small darkly-stained round nuclei in this affected area, in all layers, and a few elsewhere in the retina. van Gieson's fuchsin-picric-acid stain fails to reveal any collagen fibres in this area of the retina, but the Weigert iron-haematoxylin displays very clearly the presence of the small round nuclei above mentioned.

It is well recognised that in inflammatory conditions of the retina

and choroid, due to the action of micro-organisms or their toxins, there is an overgrowth of the pigment epithelium and a migration of masses of these cells of various sizes into the retina. But the outgrowth of a pigment process of considerable length, which carries before it the layers of the retina into the middle of that structure, seems new. Furthermore, in this case, there is no evidence of an infection with micro-organisms, and the choroid is unaffected, except for a slight degree of colloid degeneration of the membrane of Bruch—of the inner or cuticular lamella of the lamina vitrea. The fact that, in retinal detachment, the separation takes place between the retina and the pigment epithelium layer, would seem to discount the remote possibility that this microscopic appearance resulted from an extreme dimpling of the retina with its pigment epithelium from without, on restoration to its position against the choroid.

Summary. Macroscopic examination reveals no trace of retinal detachment in either eye. Microscopic examination discloses no retinal detachment in either, but shows a slight amount of exudate in Henle's layer in the left eye, and also a peculiar localized pigment proliferation in the same locality of the retina.

A CASE OF TUBERCULOUS IRIDOCYCLITIS AND PARENCHYMATOUS KERATITIS OF THE LEFT EYE, ASSOCIATED WITH TUBERCULOSIS OF THE CONJUNCTIVA OF THE RIGHT EYE, AND TUBERCULOUS LYMPHADENITIS*

BY

HUMPHREY NEAME, F.R.C.S.

LONDON

HERBERT DYKE, aged 19 years, came under the care of Mr. E. Treacher Collins at the Royal London Ophthalmic Hospital in June, 1921. The patient's occupation was that of a boot and shoe stock-keeper. He was sent to this hospital from the Victoria Park Hospital on account of loss of sight in the left eye.

His history is as follows: Dyke stated that his general health depreciated during and after a fourteen days' holiday at Southend in August, 1920. He had cycled there from London, and on his arrival felt very tired. Throughout his stay there he felt unable to exert himself. After his return to work in London, one day while stooping down he felt something " go " in his left eye, and then saw " black spots and a flash " with this eye. From that

* Shown at the meeting of the Ophthalmic Section of the Royal Society of dicine, on Friday, November 11, 1921.

date the sight of the left eye steadily diminished, until in six weeks he could only see his hand moved in front of it. About September, 1920, he noticed the appearance of lumps in the right and left sides of his neck. During this time he attended the Out-Patient Department of the Metropolitan Hospital. About six months later—March, 1921—he began to cough and he was troubled by the right eye which watered. In May, 1921, he noticed that he was becoming thinner. Dyke then went to the City of London Hospital for Diseases of the Chest, Victoria Park, where he was detained as an in-patient for five weeks under the care of Dr. O. K. Williamson.

By the kindness of Dr. C. Kingston, Registrar of the Victoria Park Hospital, information was received by the writer that no signs of tuberculosis had been found in the chest, that the sputum revealed the presence of no tubercle bacilli, and that a diagnosis of Hodgkin's disease had been made in connection with the glandular enlargement. Dyke stated that his weight, which had been taken weekly while he was in the hospital, had remained fairly constant, about 8 st. 5 lbs. in his ordinary indoor clothes. He further stated that he had never suffered from a prolonged cough until August, 1920. He started coughing shortly after his return from the Southend holiday, and had been troubled with a cough to some extent every day since then. He had no pain in the chest, but slight shortness of breath on exertion since the onset of the cough. This shortness of breath had improved latterly. He had coughed up sputum while he had been in Victoria Park Hospital, but less on his discharge from hospital, and very little since then.

Further Ophthalmic History

June, 1921. Dyke was admitted to the Royal London Ophthalmic Hospital.

There was then marked lymph gland enlargement in the anterior and posterior and suboccipital triangles of the neck on each side. The glands were smooth, firm, discrete and fairly mobile, and not adherent to the skin.

The right eye showed conjunctival injection, palpebral and ocular, and some enlarged follicles in the conjunctiva of the lower lid and to a slight extent at the inner and outer angles of the fornix of the upper lid. There were also on the lower lid several conjunctival nodules, of translucent gelatinous appearance and grey-white colour, with particularly marked injection of the conjunctiva immediately around. Single nodules were about 1 mm. in diameter. Some of the nodules were of irregular shape as if they were formed by confluence of two or three nodules. There were in the conjunctiva of the upper lid three separate very small nodules of similar appearance.

The cornea was clear and bright, the iris of healthy appearance and the pupil circular and active. The tension was normal.

The vision of the right eye, while under the effect of a mydriatic, with correction—4.0 D. sphere, —2.0 D. cyl. axis 20 degrees, was 6/12 four letters, without correction 6/60. The media were clear except for two small white dots near the centre of the anterior lens capsule, and the fundus was healthy.

The left eye showed conjunctival and ciliary injection. The cornea was vascularized and showed a general haze, superficial and deep, sufficiently dense to obscure details of all structures behind it. The lower part of the cornea was to a slight degree staphylomatous. Vision was perception of light only, and the tension was reduced.

The left eye was excised, fixed in formalin and bisected vertically between disc and macula and through the corneal staphyloma.

Pathology

Macroscopic examination. Left eyeball. (Formalin fixation, vertical antero-posterior bisection.) The cornea on section appears clear except for the lower part which is staphylomatous. Here the opaque cornea is continuous with a white mass behind it. The anterior chamber is almost obliterated, filled up with a homogeneous white mass which is continuous with remnants of infiltrated iris and ciliary body. The iris and ciliary body are only identified by the pigment tissue in their posterior surfaces; they are blended with the white mass. The lens is displaced slightly downwards. There is a semi-transparent blue-grey membrane behind the lens and ciliary body in the anterior part of the vitreous chamber. The retina shows folds here and there, and a small detachment anteriorly and below, with greenish subretinal exudate of gelatinous appearance and firm consistency. The choroid is *in situ*.

Microscopic examination. Celloidin embedding. Vertical section, sagittal plane. Sections were stained with Ehrlich's acid haematoxylin and eosin, with Weigert's iron-haematoxylin and van Gieson's picric acid fuchsin, and with Ziehl-Neelsen's carbol fuchsin.

Cornea. There is oedema and round-cell infiltration of the deeper layers of the epithelium. Bowman's membrane is intact. In the periphery there is a thin zone of cellular infiltration deep to Bowman's membrane. The substantia propria is vascularized, and infiltrated, mainly with small round cells, and chiefly in its deeper layers (see Fig. 2).

Descemet's membrane disappears abruptly at its upper and lower extremities in dense cell infiltration in the neighbourhood of the site of the canal of Schlemm, which is not visible. The central

portion of Descemet's membrane is seen in some sections to be deeply convoluted, and to have suffered some longitudinal splitting into fibrils, without actual rupture. In other sections it cannot

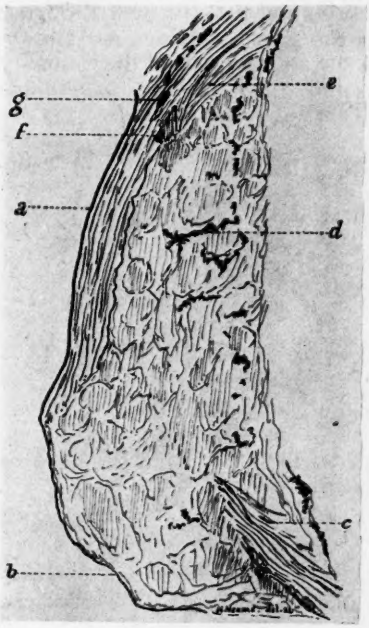

FIG. 1.

Anterior part of eye, vertical sagittal section. × 5. Shows the extensive inflammatory new-formation, which fills the anterior chamber, obliterates almost all trace of the iris and ciliary body, and perforates the limbus inferior. This section is made well to one side of the middle vertical plane, so that many ciliary processes are cut across.

(*a*) Corneal epithelium.
(*b*) Conjunctival epithelium covering the staphyloma.
(*c*) Remnants of ciliary muscle internal to the sclera immediately posterior to the perforation.
(*d*) Remnant of ciliary pigment epithelium.
(*e*) Ciliary muscle in the upper part of globe.
(*f*) Canal of Schlemm filled with cellular exudate, or obliterated by pressure of the exudate in the lymphatics around the canal.
(*g*) Tributary of anterior ciliary vessel, also filled with, or obliterated by cellular exudate. No endothelium is seen in these spaces The cellular exudate has the same structure as that of the main mass.

be traced continuously from the upper to the lower part of the cornea, and in these there is a more extensive replacement of substantia propria by inflammatory cell infiltration.

The limbus or just posterior to it—as far as can be judged,

opposite to the angle of the anterior chamber—is perforated above, in a narrow zone, by a mass of round and spindle-shaped cells and new fibrous tissue. Below there is a similar condition, except that the zone of penetration is wider, that there is a thin covering of substantia propria, and that the area affected is prominent and corresponds with the staphylomatous portion already mentioned. A thin portion of the anterior half of the eyeball was embedded by Jordan's photoxylin-paraffin method, including the most promi-

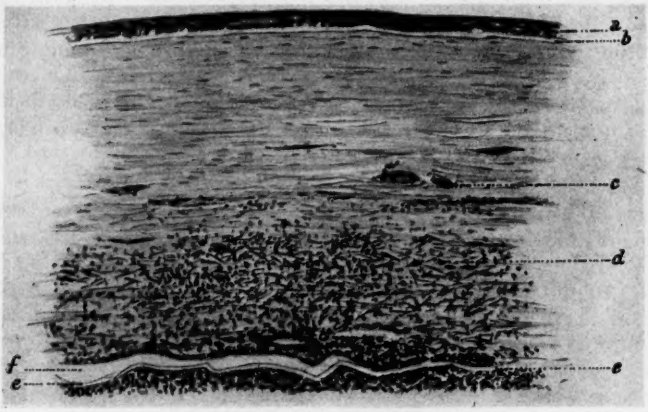

FIG. 2.

Cornea, near its centre, vertical sagittal section. Shows tuberculous keratitis, vascularization and cell infiltration particularly of deeper part, and corrugation of Descemet's membrane.

(*a*) Epithelium.
(*b*) Bowman's membrane.
(*c*) Vessels in substantia propria.
(*d*) Cellular infiltration.
(*e*) Descemet's membrane.
(*f*) Artefact, separation of Descemet's membrane. Deep to Descemet's membrane is the mass of cell and fibrous new-formation in the anterior chamber.

nent portion of the staphyloma. In sections of this part (Fig. 1) it is evident that a complete perforation has taken place at the inferior portion of the limbus, and that the direction of this perforation has been similar to that of the usual large rupture from indirect violence (1), namely, obliquely outwards from the canal of Schlemm, along the plane of the anterior ciliary veins as they pass outwards through the sclera. The free ends of the ruptured coats of the globe show this obliquity both anterior and posterior —or superior and inferior—to the perforation. These ends are separated at this site by a space of about 3 mm. which is occupied by fibro-cellular inflammatory mass. The free end of sclera

inferior to the perforation is overlapped on its outer surface by the same mass for an extent of fully 2 mm. The granulomatous tissue is covered on its outer surface by stretched corneal and conjunctival epithelium and a small amount of vascular sub-conjunctival connective tissue. Bowman's membrane is lost in cellular infiltration before it reaches the protruding mass.

The *anterior chamber* is abolished—in the sections examined,

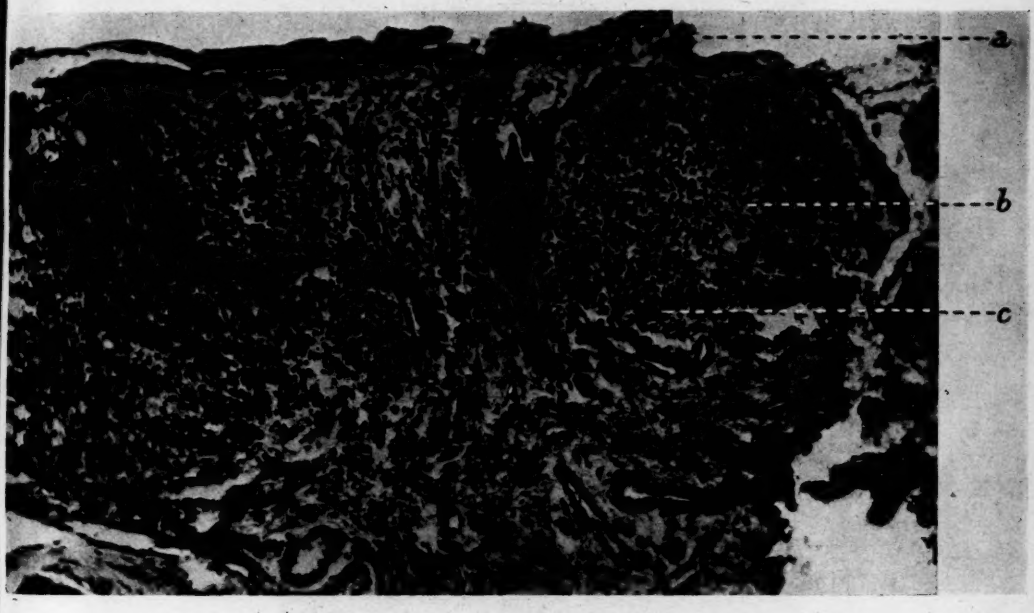

FIG. 3.

Conjunctiva of lower lid (Micro-photo). × 150 Shows two adjacent nodules.

(*a*) Stretched and atrophic epithelium

(*b*) Centre of one nodule containing a Langhans' giant cell and epithelioid cells.

(*c*) Surrounding zone of round-cell infiltration, outside of which is fibrous tissue.

which are taken from the vertical central portion of the cornea—except for a narrow cleft seen in a few sections, anterior to the lens and bounded in front by a mass of inflammatory tissue containing traces of iris pigment. The chamber is filled with a mass composed of confluent nodules of small round cells, epithelioid cells, spindle-cells and fibrous tissue, and a few giant-cells of Langhans' type with homogeneous cell protoplasm and peripheral nuclei.

The *iris and ciliary body* are largely destroyed, and replaced by a similar inflammatory formation which contains streaks and patches of pigment mainly in its posterior region. This inflammatory infiltration extends back to about half-way along the pars plana, and has destroyed by infiltration the epithelium of nearly the anterior half of the pars plana.

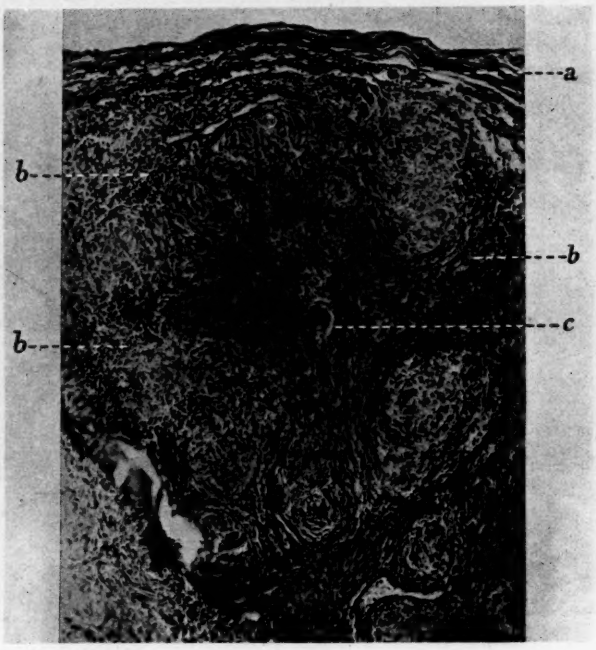

FIG 4.

Lymphatic gland (Micro-photo.). × 100, from posterior auricular region. Stain, Weigert iron haematoxylin and van Gieson picric acid fuchsin stain. Shows :—

(*a*) Fibrous capsule of gland.
(*b*) Remnants of lymph-cell formation.
(*c*) Large ill-formed giant-cell.

The main structure is very rich in collagen fibre stained red with van Gieson stain. This can be seen to be arranged in a nodular formation.

The *Lens* shows a well-marked anterior capsular cataract, formed of very long spindle shaped cells. Between and around the fibres of the suspensory ligament of the lens is an extension of the inflammatory mass, and in the vitreous immedately posterior to this are groups of small round cells.

The *retina, choroid and optic nerve* are normal.

On July 21, 1921, a fragment of conjunctiva was removed from the right lower lid in its outer part, including several of the grey-white translucent nodules already described. In the interval since the removal of the left eye the nodules in the conjunctiva of the right lower lid had slightly increased in size. Half of the tissue, pinned out on card, was fixed in Zenker's fluid for eight hours, treated in the ordinary manner and embedded in paraffin. The other half was introduced into the subcutaneous tissue of a guinea pig.

Sections of the conjunctiva were stained with Ehrlich's haematoxylin and eosin, with van Gieson's picric-acid fuchsin and Weigert's iron haematoxylin, with Pappenheim's stain, and with Ziehl-Neelsen's carbol-fuchsin. The microscopic appearance of the sections was that of a granulomatous condition of the conjunctiva with a moderate amount of fibrous tissue formation. The sections stained for tubercle bacilli failed to disclose any organisms. An isolated nodule removed at the same time from the upper lid was teased out and stained by the same method by Dr. S. H. Browning with a similar negative result.

The guinea-pig inoculation of conjunctiva was performed by Dr. P. Fildes at the London Hospital. This also gave a negative result.

On September 29, 1921, with Mr. Treacher Collins's permission, a further piece of conjunctiva was removed from the right lower lid, and two small discrete lymph glands were excised from the subcutaneous tissue behind the right ear. One lymph gland was used for a further inoculation test on a guinea-pig by Dr. Fildes. The weight of the guinea-pig was as follows:—

29/ 9/21	...	...	360 Grams.
7/10/21	...	...	370 ,,
13/10/21	...	...	440 ,,
22/10/21	...	...	450 ,,
10/11/21	...	...	440 ,,

On November 10 there was a firm swelling in the subcutaneous tissue at the site of inoculation, adherent to the abdominal wall, with the skin movable over it. The animal was killed and the swelling was opened.

Dr. Fildes' report follows:—

" London Hospital, Bacteriological Department,

November 10, 1921.

Guinea-pig 360 grams. subcutaneous inoculation 29/9/21, with a whole lymphatic gland (8 mm. diam.) ground up in sand.
10/11/21 weight 440 grams. Killed.

Small local subcutaneous abscess, containing dry necrotic pus. No tubercle bacilli found. No tuberculosis elsewhere."

The other lymph gland and the conjunctiva were fixed in Zenker's fluid, treated as usual and embedded in paraffin.

Histology of the conjunctiva and lymph gland. The serial sections of part of this specimen of conjunctiva were stained with Ehrlich's haematoxylin and eosin, or with Weigert's iron haematoxylin and van Gieson's picric-acid fuchsin stains. They show in section several distinct nodules up to 0.5 millimetre in their longest dimensions. (See Fig. 3.) These nodules are subdivided into smaller nodules of cells by slender collagen fibres—as shown by van Gieson's stain—and the smallest of these subsidiary nodules measures 70 μ in diameter. There are seen in some of the sections, well formed nodules bounded by fibrous tissue, composed mainly of small round cells, with a central zone of epithelioid cells and a giant cell among them, and with a few of the plasma type of cell.

Sections of the lymphatic gland were stained in a manner similar to that of the conjunctiva, and in addition with Pappenheim's pyronin methyl green stain. The sections show the gland with a dense fibrous tissue covering. This covering in places sends many collagen fibres into the gland itself, to blend with an abundance of collagen fibres in the stroma. The normal lymphatic gland structure has disappeared. There are but a few small islands of lymphocytes here and there. The bulk of the gland is formed of rounded nodules, of size similar to that of the conjunctival nodules, but composed of epithelioid cells and fibroblasts (see Fig. 4). There are a few scattered lymphocytes, and in some of the nodules in section only two or three of these cells are to be seen. The most marked feature in the sections stained by van Gieson's method, is the fibrous tissue formation. Around and between the nodules there is an abundance of collagen fibres, and into most of the nodules pass numbers of slender fibres of this variety. No areas of necrosis are to be seen. In the presence of such a large amount of fibrous tissue in the gland, it seemed certain that the tubercle bacillus would not be found, and no sections were therefore stained with carbol fuchsin.

Conclusions

Lymph glands. It is possible that there are two separate pathological conditions present at one and the same time. As far as the lymphatic gland enlargement is concerned, the diagnosis lies between tuberculous lymphadenitis and Hodgkin's disease—or lymphadenoma.

Although the result of the inoculation of the tissue of one complete but small lymphatic gland into a guinea-pig was negative,

this does not exclude the presence of tuberculosis. Nor does the absence of signs of tuberculosis in the lungs and of tubercle bacillus in the sputum lead necessarily in the same direction. This evidence is entirely negative, and merely a lack of support to the diagnosis of tuberculous lymphadenitis. An explanation of this failure is found in the histological examination of the lymph gland. The extreme fibrosis evident in sections stained by van Gieson's method, and the replacement of almost all lymphatic tissue thereby, indicates that the tuberculosis, if present, is of a very chronic form and vigorously resisted by the tissues. This readily accounts for the fact that tubercle bacilli were not found. In very chronic forms of tuberculosis, as lupus vulgaris, the search for the tubercle bacillus in the lesion entails much labour and is not often successful. Further, in such conditions, the result of guinea-pig inoculation is not invariably the production of tuberculosis in the animal. Such fibrosis of lymphatic glands is found in advanced stages of Hodgkin's disease, as well as in very chronic tuberculosis. But the nodular arrangement of the fibrous tissue throughout the gland, as in this case, supports the diagnosis of tuberculosis.

To summarize the evidence bearing upon the diagnosis of the lymph gland condition, we have—

(1.) In support of that of Hodgkin's disease.

(*a*) Absence of necrosis or caseation, although even in Hodgkin's disease this sometimes occurs[2].

(*b*) Marked fibrosis in the gland.

(*c*) Negative bacteriological results to section examination and inoculation.

(2.) That these three facts (*a*), (*b*) and (*c*) are not evidence against the presence of a very chronic tuberculosis.

(3.) In favour of tuberculosis—(*a*) The nodular histological structure within the lymph gland, and (*b*) the absence of eosinophile cells.

Iridocyclitis. (*a*) The presence of an extensive granulomatous formation of slightly nodular structure, in anterior chamber, iris and ciliary body, (*b*) the erosion and perforation of Descemet's membrane and of the whole thickness of the cornea with the production of parenchymatous keratitis, are sufficient evidence, taken in conjunction with the history and clinical condition, to warrant the diagnosis of tuberculous iridocyclitis and keratitis.

Conjunctivitis. Although the histological structure of the nodules described bears some resemblance to that of early trachoma follicles and also of ophthalmia nodosa[3] or pseudo-tuberculosis[4], the presence of the nodules in this case on the palpebral conjunctiva only, and the absence of caterpillar hairs in any of the histological sections opposes the latter diagnosis, and the absence of

other typical signs of trachoma, and the presence of tuberculosis elsewhere, are sufficient grounds for the diagnosis of the miliary type of tuberculosis of the conjunctiva.

It seems justifiable, therefore, to conclude that all the pathological conditions are due to one cause, namely, tuberculosis.

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CLINICAL NOTES

THE DIAGNOSIS OF SUB-RETINAL TUMOUR

BY

A. J. BALLANTYNE, M.D.

GLASGOW

A CASE of detachment of the retina in which there is reason to suspect the presence of a sub-retinal tumour may give one a good deal of anxiety, and one does not feel justified in proposing excision of the affected eye before having employed every method which will help to make the presence of a neoplasm reasonably certain. I have sometimes been disappointed with the results of transillumination, and in two recent cases I have tested the character of the detachment by noting the effects of puncturing it under direct ophthalmoscopic examination. I mentioned the method at the November meeting of the Scottish Ophthalmological Club, and as it seemed to be new to the members I bring it forward in the hope that it may be helpful to others.

The case in which I employed it most recently was that of a woman, 46 years of age, presenting a prominent detachment of the retina in the lower nasal part of the fundus, highly suggestive of a sub-retinal neoplasm. Tension was normal, and there had been no pain or redness of the eye. Transillumination gave a doubtful result. A scleral puncture at the supposed site of the tumour gave exit to a small quantity of yellowish glairy fluid, but made no appreciable change in the prominence of the detachment. A few days later, under a local anaesthetic, a discission needle was inserted through the sclerotic in the upper and outer segment of the globe, passed across the vitreous, and, under direct observa-

tion with the electric ophthalmoscope, passed into the elevated retina, avoiding the retinal vessels. Immediately a little blood was seen to ooze out of the puncture, and on giving the needle a quarter turn a larger jet of blood passed out into the vitreous. One also noticed that the needle point did not displace the mass, but penetrated it, and one was conscious of a certain degree of resistance. Had the detachment been due to the presence of fluid one would have expected the retina to yield before the needle, there would have been no sense of resistance, and no haemorrhage would have occurred.

In both of the cases in which the procedure was tried the eye was afterwards excised, and a choroidal sarcoma was found to be present.

While not attempting to minimize the value of other methods of diagnosis in these cases, I would suggest that we have here an additional method which is both simple and reliable.

SARCOMA OF ORBIT*

BY

V. O'HEA-CUSSEN, M.B., B.Ch., B.A.O.

MERCY HOSPITAL, CORK

THE patient was a woman of 40 years of age, the wife of a farm labourer, and of robust appearance.

Up to November 13, 1918, she enjoyed perfect health. Late that evening she experienced severe pain in the right frontal and temporal regions which kept her awake, and which was accompanied by vomiting. During the night she experienced the sensation of something bursting over her forehead, after which all pain subsided. Next morning the eyelids were swollen to a degree which prevented the eye being opened. Her local doctor saw her and sent her to the local hospital, from whence she was sent to Cork on November 17. When I first saw her the following day the eyeball was half protruding between the lids, which were greatly swollen and intensely red. The edges of the lids, the cornea, and the exposed portion of the conjunctiva were gangrenous. Temperature and pulse were normal. Patient complained only of a dull ache. Examination of the nose for sinus disease was negative.

That evening, under general anaesthesia, the orbit was probed for pus in all directions, but none was found. The eye was then enucleated, this only requiring division of the optic nerve and a

* Case shown before the Cork Medical and Surgical Society.

few shreds which were all that remained of the recti muscles, the external canthus having been divided. Very free haemorrhage followed, which was easily controlled by pressure and gauze packing.

On examination of the globe a deep furrow was seen in the sclera just behind the limbus, due to the pressure of the lids. On section a choroidal haemorrhage ⅛ in. thick was found extending all round. The retina was everywhere in position, and there was no sign of a new growth.

As post-operative treatment, first dry, and later moist dressings were applied to the remaining mass with no effect. The previous soft swelling was gradually replaced by a harder one, and about a fortnight later I took a section of it and sent it to the pathologist who diagnosed it as " spindle-celled sarcoma."

On December 17 a typical exenteration of the orbit was performed, the lids being included. At a suspicious place on the orbital plate of the superior maxilla a portion of bone was removed. Finally, the skin was sutured to the periosteum, and the orbit packed with gauze for a few days, when the latter was replaced by a surface dressing. The orbit was allowed to fill up with granulations, whilst the epithelium grew backwards, and finally covered the surface of the former. The patient was discharged from hospital on February 18, 1919, the process of healing being nearly complete.

From a cosmetic point of view the result is very good.

When communicated with recently the patient was in good health, and there was as yet no sign of a local or general recurrence of the disease.

The extremely short history given by the patient is surprising, and no amount of questioning revealed a longer one. Examination of the exenterated mass gave no clue to the site of origin of the growth, which, I presume, arose from some of the orbital tissues.

PAPILLITIS DUE TO TONSILLITIS: THREE CASES

BY

P. A. HARRY, M.D.,

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PYORRHOEA is not an uncommon cause of eye disease, and although this condition is often associated with tonsillitis it is unusual for the latter alone to produce optic neuritis.

The principal features are :—Intensity of the papillitis; completeness with which papillitis cleared up; the unilateral character.

Mr. B—, aged 35, gave a history of sudden diminution of vision in right eye, severe frontal headache. Examination showed dilated pupil and intense optic neuritis in R.E., there was no P.L. L.V. 6/6, left field normal.

Investigation of cause showed that patient was in perfect condition, formerly suffered from rheumatism, nasal sinuses apparently normal, teeth artificial, both tonsils presented appearance of chronic follicular tonsillitis. Immediate removal by enucleation advised. The headache was more intense after removal, with increase rather than abatement of neuritis. Administration of large doses of sodium salicylate produced diminution of the papillitis with complete cure and restoration of vision in two weeks.

Miss M., aged 30, gave a history of having suffered from many attacks of quinsy. Recently had partial removal of tonsils performed; now complains of loss of sight; R.V. barely 6/60, L.V. normal, refraction hypermetropic. Right disc swollen, edges ill-defined, whitish exudate noticed; left fundus normal. No cause discovered for the unilateral neuritis, except for post-operative tonsillitis. Treatment sod. salicyl.

Miss Agnes W., age 27, single, gave a history of severe headache, worse in left temporal region, duration three weeks, onset sudden, has been treated by family doctor with powders which only gave temporary relief. Ptosis left, slight at first becoming worse during last week, patient still at work (shop assistant). Ocular examination showed dilated pupil left, well marked papillitis, area of disc increased, R.V. 6/6, L.V. hand movements, slight tenderness on pushing left eye backwards in orbit. Urine normal.

No nasal disease, patient rheumatic but otherwise healthy, no pyrorrhoea, both tonsils enlarged and septic purulent material could be squeezed out of the follicles. Operation of tonsillectomy refused. Large doses of sodium salicylate prescribed. After ten days the headache disappeared and ptosis less marked. Margins of disc still obscured and irregular, swelling less marked, no exudate. L.V. 6/18. Patient discontinued treatment without permission and although a holiday was advised she would not take one. Six weeks after her first visit she returned with history of renewed headaches not markedly temporal, loss of vision right, R.V. hand movements, L.V. 6/6, no error of refraction. Intense optic neuritis right eye, congestion of left disc but no papillitis, moderate ptosis right. Exacerbation of follicular tonsillitis, tonsil plus 3, and decidedly inflamed. Treatment with sodium salicylate commenced and left tonsil dried and carefully swabbed with 10 per cent. solution of silver nitrate. In three weeks all symptoms had disappeared, vision perfectly normal, no ptosis, fundi normal.

MYOPIA IN AN INFANT

BY

R. WALLACE HENRY, M.D.

LEICESTER

IN January, 1921, an infant fourteen days old was sent to me, with a history of birth after a difficult labour necessitating instrumental delivery.

On the eyes being opened a left convergent strabismus was noticed by the doctor in attendance.

On examining the baby I found a marked left convergent strabismus, apparently resulting from paralysis of the left external rectus, as although the baby followed a light readily, it did not bring the left eye past the middle line. There was also some paresis of the right external rectus. On examining the fundus, which proved to be normal in each eye, I found there was a considerable degree of myopia, and ascertained by retinoscopy that there were ten dioptres of myopia in each eye.

I saw the child about six weeks later, when the movement of the right external rectus was normal, and there was some movement of the left external rectus also, the parents stating that at times the squint was scarcely noticeable.

I again worked out the refraction with the same result. The eyes appeared to be normal in size, and the corneas and anterior chambers presented no unusual feature, so that it is improbable that it is a case of commencing buphthalmos.

ANNOTATIONS

Some Phases of Quackery in relation to Diseases of the Eye

Mr. Cyril H. Walker, in his Presidential Address at the opening of the Forty-eighth Meeting of the Bristol Medico-Chirurgical Society, drew attention to the fact that no branch of medicine has been and probably is more invaded by advertising charlatans than ophthalmology. The term " quack " or " quack-salver " came into common use in the reign of Charles I., and referred to the noisy chatter of medicine vendors at fairs. Recently a quack has been defined as a man who is more interested in himself than in his healing art, caring more for his patent than his patient. One might almost substitute the word " pocket " for " patent." During the middle ages the treatment of disease of the eye was largely in the hands of these itinerant quacks who went from fair to fair couching cataracts and selling their preparations. It is also of interest to know that the still popular Singleton's golden eye ointment was in vogue over three hundred years ago and sold at fairs by these quacks. In James I's reign these quacks first

received the name of " oculists," and when Queen Anne came to the throne a great fillip was given to these oculists, as she herself suffered from defective sight, and she also revived the custom of " touching " for King's evil, and took fees in the form of " touch-pieces " from patients. Queen Anne appointed two charlatans as oculists to the Court. One was William Read, a tailor, who subsequently received a knighthood for curing a number of seamen and soldiers gratis, and the other, Roger Grant, either a shoemaker or a tinker. The latter was notorious for " putting out eyes with great success." In this irregular way the now much coveted title of " Surgeon-oculist to the King " arose. About this time the king of all quack oculists, Chevalier Taylor, flourished; he was a qualified surgeon, an account of whose life is given by Coats in the *Royal London Ophthalmic Hospital Reports* for 1915. He was appointed oculist to the Pope and to the Kings of England, Denmark, Poland, Norway and Sweden, and he used to go about in a carriage painted all over with eyes with the motto on it of " Qui visum dat, vitam dat." He operated on Handel for cataract, " but on drawing the curtain we found the bottom defective."

Coming to later day quacks in this country, they seem to be divided into two classes, foreigners who come from a German-speaking country and set up for a time in one of our big hotels, their coming having been duly advertised beforehand, curing every disease of the eye by lotion, drops or glasses. The other, perhaps less reprehensible, is represented by the optician who lays himself out for a course of treatment by strong glasses or other means and charges exorbitant fees for the same. There is still a further class whose activities are usually shortlived, such as the case of the Indian oculist who used to remove pieces of tissue from the conjunctiva, and more recently the beauty specialist who excises redundant skin about the eyelids in old people. Mr. Cyril Walker ends his most interesting lecture by urging the general practitioner actively to assist in the suppression of quackery in ophthalmology by keeping in touch with the nearest eye clinic and sending all cases for consultation, thus not only maintaining his interest in ophthalmology but learning better its possibilities and limitations, enabling him to decide when to persuade his patients to seek special advice rather than allowing them to drift into the hands of the optician or quack. By doing this he will more than ever deserve to be regarded as their guide, philosopher and friend.

Amaurosis after Loss of Blood

Little attention has been paid to this curious phenomenon in the standard text books. The Ophthalmological Society of Paris had an interesting discussion on the subject at a recent meeting

(an account of this is to be found in the *Arch. d'Ophtal.* for January, 1922). Dr. A. Terson read the opening paper summing up the various points of interest and the work of previous observers. In the first place it is a rare occurrence in spite of the frequency of the profuse haemorrhages that might give rise to it. In the second place it hardly ever follows immediately on the haemorrhage, but makes its appearance from three to eight days later, and never at a greater interval than three weeks. It is of more frequent occurrence in patients over forty, in women, and in people in a state of bad general health. The usual ophthalmoscopic picture is one of ischaemia of the optic nerve with contracted retinal arteries, and occasionally some oedema of the optic disc and retina. The usual termination is partial or total atrophy of the optic nerve. The affection of sight is frequently accompanied by evidence of participation of other nerves and centres (deafness, oculo-motor paralyses, intense headache, coma, polyneuritis). Terson pointed out that blindness also occurred after haemorrhage in animals.

Retinal ischaemia alone might account for the cases, few in number, that follow directly on the loss of blood, but does not explain the majority of cases that develop at a later period. For those he suggests a process analogous to that seen in anaphylaxis. The fact that the affection is most frequent in patients in a bad state of health lends some support to the theory of a neurotoxaemia, as suggested in a paper by Terrien noticed elsewhere in this journal. Post-mortem examination of cases has shown no signs of inflammation, nor have any embolisms or thromboses been observed. The conditions found have been those of an ascending atrophy of the optic nerve of peripheral origin, accompanied by degenerative retinal lesions. Holden claims to have been able to produce the same results by repeated bleeding in animals.

As regards treatment, in addition to the usual general treatment for haemorrhage, Terson advocates repeated paracenteses of the eye and the use of dionin.

In the subsequent discussion several surgeons gave notes of cases. M. Rochon-Duvigneaud made the interesting observation that veterinary surgeons habitually bled horses suffering from congestive colic to the extent of five or six litres. Blindness, which lasted four or five days sometimes followed this operation. In contrast to this at the Pasteur Institute horses were repeatedly bled to large amounts in the manufacture of serum without any untoward results. Although these horses are old they are in good health, and Rochon-Duvigneaud suggests that the general health of the animal is probably the determining factor.

ABSTRACTS

I—DETACHMENT OF THE RETINA

Gonin, J. (Lausanne).—The pathogenesis and pathological anatomy of retinal detachments, excluding those due to trauma, to neoplasms, and to parasites. (Pathogénie et anatomie pathologique des décollements retiniens, à l'exclusion des décollements traumatiques, néoplastiques et parasitaires.) "Report presented to La Société française d'Ophtal."

This report, by an acknowledged authority on the subject of detachment of the retina, is of sufficient value and interest to deserve a somewhat lengthy abstract.

By way of a short designation for the group of cases embraced by his title, **Gonin** suggests the name " idiopathic," the common characteristics of the cases being: that they present no apparent participation of the other ocular membranes, that they are free from external irritation, that most of them have no known cause, and that, as a rule, there are no prodromata, or these are slight and consist of floating spots or luminous phenomena which make their appearance a few days or hours before the occurrence of the detachment. The frequency of these cases is shown by the author's figures. His material consists of 200 traumatic cases, 50 due to the presence of a neoplasm and only 37 " idiopathic," of which one half are useless for detailed examination.

Clinical features. The onset may be quite sudden, and associated with cough, effort while stooping, the lifting of a heavy weight or the congestion produced by a hot bath. In these cases usually the upper part of the fundus is the one affected. In others the onset is rapid, but less sudden, announced by some ill-defined sensation, and causing the patient little uneasiness unless there is metamorphopsia due to involvement of the macula. In a third group onset is gradual, and perhaps the defect is only perceived accidentally or when the other eye becomes affected. In these cases it is usually the inferior segment which is the seat of the detachment.

Tension is usually normal at the time of onset, but during the first weeks or months cyclitis may develop, with hypotony, and in the later stages, perhaps after years, glaucoma may complicate the case.

If the case is seen a few days after the occurrence of the detachment, two kinds of change may be detected in the vitreous. The

first is due to detachment of the vitreous, and consists in a certain deformation of the details of papilla, etc., which varies with movements of the eye as by an irregular parallactic movement, such as results from irregular astigmatism in lens or cornea. In the periphery of the vitreous, especially at the site of the detachment, we may find a diffuse opacity of the vitreous, as well as dark spots and streaks.

The detachment occupies a peripheral section of the fundus, with or without involvement of the macular area, but practically never the macula without the periphery. It occurs twice as often in the upper as in the lower part of the fundus, and, of course, corresponds with the defect in the field of vision. The most prominent form is that situated in the upper region, which looks like a large fluctuant sac hanging in the vitreous. At the other extreme is the form often seen in the lower region, which takes the form of a low elevation with practically no folds. Idiopathic detachment is distinguished as a rule from that due to tumour by a multiplicity of folds, and, when it takes the form of a rounded sac, its silky surface, its relative transparency and its mobility.

Ruptures of the retina, single or multiple, are almost always found in recent cases. They occur at the period of onset. The rupture sometimes takes the form of a crescent with its convexity towards the disc, the flap of tissue between the horns of the crescent being drawn forward into the vitreous like the flap of a valve. In other cases the perforation is of a punched-out character, and in such a case the detached portion may be seen lying in the vitreous in front of the rupture. In other cases there is a linear rupture at the ora serrata, no flap being seen. Whatever may be the type of rupture, it indicates the point of origin of the detachment. In a fresh case it often occupies the summit of the detachment, but at a later stage it may be found elsewhere, for example, in the upper part of the fundus after the detachment has shifted to the lower. The author states that the rule may be laid down, that cases of sudden onset have for point of origin a superior section of the retina, and present a crescentic or punched-out rupture, while cases of slow development are often in the lower part of the fundus, and, if they present a rupture, it is often at the ora serrata.

Small haemorrhages are sometimes seen scattered over the detached retina, but even more frequent are pigment deposits. Foci of choroiditis may be seen, either through the detached retina or through the rupture, and the frequency with which there is exact correspondence between the position of the rupture and that of a choroiditic focus shows that this association is not accidental.

The tendency of detachment of the upper region of the retina to shift to the inferior region of the fundus makes this form more

resistent to treatment than that in which the lesion is from its onset situated in the lower area. In settling down, the detachment tends to invade the lateral regions, either on the nasal side, where it may extend as far as the margin of the disc, or on the temporal side, endangering the macula. On the manner in which this critical period is passed depends the question of the general diffusion of the detachment, or its reapplication, more or less complete and durable, in the upper region, and its definite localization in the lower. Having once reached the latter situation it tends to remain stationary. Even when a detachment reaches the very border of the macula, it is still compatible with good central vision.

Theories of pathogenesis. The three theories which have received most support are: the distension theory, the exudation theory and the traction theory.

The distension theory is based on the idea that if an eyeball is stretched or distended the less distensible retina comes to occupy the chord of the arc between its points of attachment. Such a distension is supposed to occur typically in a case of high myopia. The theory fails to explain why, in myopia, the detachment does not occur at the age when the myopia is progressive, but at a time when the elongation of the eye has long come to a standstill. Again, the idea that the retina is not extensible is not only insufficient, but is contrary to the facts.

The theory that detachment is caused by the forward pressure of a subretinal exudate fails on various grounds. Choroidal exudates do not form with sufficient rapidity to produce the sudden variety of detachment, they do not occur more frequently in the upper region of the fundus than elsewhere, and rather than go on distending one part of the retina to the point of producing a rupture such an exudate would tend to separate the retina over a larger area. Again, a sudden or rapid exudation sufficient to produce a large detachment would be sure to lead to an elevation of intraocular pressure. Another objection is that it is quite unusual for detachment of the retina to follow an acute choroido-retinitis. Sub-retinal exudates are regularly followed by reapplication of the elevated retina and the formation of cicatrices between retina and choroid. In the detachment associated with albuminuria rapid cure is as common as it is rare in idiopathic detachment. This theory must be reserved for the cases of detachment of slow development, occupying in a diffuse manner a large part of the fundus, without fluctuations of the surface and with a minimum of folds, with no discoverable rupture, and tending, after a short period to disappear spontaneously.

The traction theory was put forward by Leber in 1882, and was based on the cases of intraocular disturbance due to metallic foreign

bodies, in which contraction of the vitreous led to detachment with rupture of the retina. Leber held that the ruptures so frequently observed in spontaneous detachment also resulted from traction exercised on the retina by the vitreous, and that the detachment was brought about by the passage of vitreous through the opening thus formed. Thus were to be explained the sudden onset and the absence of elevation of tension. The large retinal sac did not imply the formation of a sub-retinal exudate, but a mere displacement of the intraocular fluid. Gonin, at first an opponent of the theory, is now its most convinced advocate. The initial occurrence of a rupture by traction on the retina explains the sudden onset in a way which is impossible to the other theories. Again, the communication between the vitreous chamber and the sub-retinal space explains the sudden or rapid changes which may occur in the position or volume of a detachment, for example, the apparent cures and disappointing relapses which may occur during treatment. The persistence of the rupture is the cause of the persistence of many detachments, and, far from being a feature favourable to repair, as believed by von Graefe, it is its presence that justifies and explains the peculiarly hopeless prognosis of idiopathic detachment. The traction theory, however, involves certain important assumptions: the pre-existence in the vitreous of changes which will allow a displacement of the retina at the moment of the rupture, the accumulation of liquid in quantity sufficient to penetrate through the opening, and a cause of traction so energetic as to provoke the tearing of an opening in the retina.

The author believes that these assumptions are justified on both clinical and pathological grounds. The clinical picture of the early cases, as already described, makes it probable that there is a condensation of the vitreous body, shrinkage of its volume, and detachment of its posterior segment, and accumulation of fluid between it and the anterior surface of the retina.

After a series of brief answers to various objections which have been raised against the traction theory, the author controverts the idea that the downward displacement of a detachment indicates that the sub-retinal fluid is denser than that in the vitreous chamber, and explains in some detail what he conceives to be the probable mechanism of this change.

In his third chapter he proceeds to gather the evidence in favour of the traction theory which is derived from dissection of affected eyes, laying some stress on the value of macroscopic examination, which should not be entirely overlooked in favour of microscopic examination. After a general statement of the changes which one may find in the retina itself, in the vitreous, the uvea, etc., he proceeds to a detailed account of the conditions found in twelve cases already published, and in eight unpublished cases which he

is now able to put on record. These twenty cases, with four others which bear a certain resemblance to them, are tabulated in such a way as to show the age of the patient, the nature of complications, if any, the type of the detachment, the presence or absence of rupture of the retina, the condition of the intraocular fluids, and the state of the uvea. Two facts of importance which emerge are: the presence of one or more ruptures of the retina in every case where they were carefully looked for, and the identity of the pre-retinal and retro-retinal fluids; both facts which support the theory that it is attraction of the retina by a force acting on its anterior surface which is the factor common to all the cases of idiopathic detachment.

In Chapter IV, in which the author discusses the pathogenesis of detachment of the retina, he draws attention at the outset to the interesting fact that he is now in the unusual position of having to defend the traction theory against the objections of its principal author, Leber. In 1908, at Heidelberg, Leber, while adhering to the general principle of traction, adopted the idea that the force in question results, not from contraction of the vitreous, but from the contraction of a new-formed membrane on the anterior surface of the retina. The author, having reviewed the available pathological material and compared it with Leber's descriptions and illustrations, finds that in all material details he and Leber agree, but that the interpretation which the latter gives to the objective conditions rests on a too exclusive reference to the microscopic, and too little attention to the macroscopic appearances. Gonin admits the frequent presence of a new-formed membrane spread out on the anterior surface of the retina, but he easily disposes of the idea that the contraction of such a tissue is able to produce a retinal detachment with the characteristics belonging to the group under discussion. His pathological investigations have convinced him that idiopathic detachment is brought about by contraction of the vitreous, and that this is not caused by fibrillary degeneration of the vitreous itself, as first suggested by Leber, but by the presence in the vitreous of strands of epithelial cells undergoing a connective tissue transformation. The source of these cells is the epithelium of the ciliary body, and the cause of their proliferation and migration into the vitreous is to be found in nutritional disturbances in the anterior part of the uvea, while degeneration of the vitreous itself leads to the formation of lacunae which provide paths for the immigration of these cellular elements from the ciliary epithelium.

It is noteworthy that the conditions most favourable to the occurrence of idiopathic detachment of the retina—myopia and other forms of ectasia of the globe, senility, the presence of foci of choroiditis (syphilitic, tuberculous, etc.), are the very conditions

which favour the occurrence both of circulatory disturbances in the anterior uvea and degeneration of the vitreous.

It is easy to understand the part played by trauma in the causation of detachment in eyes predisposed to it. A blow or jar, causing a sudden displacement of the intraocular media, may, by aggravating an already latent traction of the vitreous on the retina, cause a tear in the latter, and thus determine the onset of a detachment. This explains also the seriousness of loss of vitreous in a myopic or ectatic eye, or in one affected with choroiditis.

The concluding section of Gonin's report deals with detachments in hydrophthalmos, in vitreous haemorrhage, in metastatic ophthalmitis, in acute inflammations of the choroid and sclerotic, in albuminuric retinitis, exudative retinitis, etc. In the first of these the mechanism is the same as that applicable to idiopathic detachment in myopia. In vitreous haemorrhage traction is the cause of the detachment, but it is the late effect of the contraction of organized blood clot in the vitreous. In the other cases the formation of a sub-retinal exudate is the cause of the elevation of the retina.

A. J. BALLANTYNE.

II—POST-HAEMORRHAGIC AMAUROSIS

(1) **Terrien, Dr. F.—Post-haemorrhagic amaurosis. (Amaurose hémorragique.)** *Arch. d'Ophtal.*, May, 1921.

(1) Terrien, in the paper here noticed, gives notes of two cases of defective sight following severe haemorrhage. The first case was that of a woman of 30 who had been confined four months previously. Haemorrhage had been very profuse, necessitating repeated injections of serum. She consulted Terrien four months later on account of defective vision. Ophthalmoscopic examination showed partial optic atrophy. Vision of right eye was 1/4 and that of left 1/5. Visual fields were generally contracted and the lower part of each field was nearly lost.

The second patient was a soldier, 24 years of age, who had been severely wounded in the left leg by a shell and not brought in for four days. Gas gangrene had set in and immediate amputation had to be performed. As he began to improve he complained of loss of sight. When Terrien saw him, about a fortnight after the injury, vision in right eye was fingers at 1.5 m., and in left eye hand movements at a few centimetres. The pupils were moderately dilated and only reacted slightly to the brightest light though the convergence reflex was preserved. There was some haze of the

optic discs and their margins were indistinct. The fields of vision were greatly contracted and, as in the previous case, the inferior part was almost abolished. The pupillary reactions recovered and there was a small improvement in vision (R.V. 1/10; L.V. fingers at 25 cm.).

In commenting on these cases Terrien admits the difficulties in the way of a pathological explanation. If they were due directly to the anaemia they should occur immediately; but this is hardly ever the case. He considers that the presence of slight symptoms of neuritis and the usual affection of the lower part of the field of vision give a clue to the explanation. His explanation is that the affection starts with retinal anaemia, which allows any toxin present to act more powerfully as it is less diluted, and that the superior part of the retina from the position of the head has a poorer blood supply. He points out that the rarity of such cases in purely traumatic cases, as contrasted with their greater frequency in diseased conditions, in which toxins would naturally be present, lend support to his theory. E. E. H.

(2) **Magitot.—The retinal vascular pressure in a case of post-haemorrhagic blindness.** (**La pression vasculaire rétinienne dans un cas de cécité post-hémorragique.**) *Ann. d'Ocul.*, Vol. CLVI, November, 1919.

(2) **Magitot** investigated a case of post-haemorrhagic blindness by the method of Bailliart, using, he says, a large enough ophthalmoscopic image to show the slightest or earliest pulsations. He gives a detailed account of the case, a woman of 52, who was suddenly seized in the street with haematemesis, became unconscious, and had to be taken home. That afternoon there was much melaena, but she so far recovered as to be able to write two letters, showing that up to that time there was no gross visual upset. Next morning she had another syncopal attack with loss of consciousness and was taken to hospital, where some hours later she came to herself and stated that she did not see or hear any more. Hearing returned next day, but sight did not return till the sixth day, and then only in the left eye. Magitot was called in to see the case on the eighth day, and on the ninth day he found the general blood pressure by the Vaquez-Lauby apparatus 5 to 9.5, while the Schiötz tonometer gave 10 mm. Hg. for each eye. Right vision was 1, with much contracted field; left hand movements. On the 26th day both discs very pale, especially left. The slightest touch on the eye caused the veins to empty themselves. Tension 15 mm. Hg. On the 36th day no spontaneous venous pulsation; tension 20 mm. Hg. The last observation was made on the 41st day and showed right field to be restricted to the central area and the upper outer quadrant, while the left had hand movements only

in the temporal field. The arterial pressure (Vaquez) was from 5 to 10 cm., retinal pressure 15 to 50 early in the case and later 30 to 65.

Detailed figures are given and then Magitot makes the following observations :—

(*a*) Relation between the retinal and the general blood pressure. The general pressure after having remained to the 16th day at 5/10 cm. had gone up slightly by the 36th day, and even on the 39th had a tendency to progress 6/11.5. During this lapse of time the graph shows the minimum retinal arterial pressure very low at first, rising rapidly to reach the normal on the 26th day. Thus there seems to be a real dissociation between the two pressures. The optic atrophy had progressed between the 9th and the 26th day. This anatomical fact might perhaps explain the rise of arterial pressure in the central artery, but Magitot puts this suggestion forward tentatively, for, as Bailliart has said, we do not yet know the *formule* of optic atrophy, which at first may not be the same for all the atrophies. Later when the arteries are filiform the vascular pressure is perhaps the same for all. Early in the case the blood pressure of a post-neuritic atrophy may differ from that of tabes or that after haemorrhage.

(*b*) Relation between venous pressure and ocular tension. The venous pulsations being almost always spontaneous, one may, therefore, conclude that the minimum pressure was very near the intraocular tension. The graph shows that the only time these pulsations were not spontaneous one induced their appearance with a weight so slight that one could hardly attribute more than 5 mm. Hg. between the minimum venous pressure and the ocular tension.

(*c*) Minimum and maximum of retinal veins. The figures between venous diastole and systole have always been close. The veins pulsating spontaneously one may deduce therefrom that the ocular tension would equalise the blood pressure. On the other hand, the slightest pressure on the globe flattened the central venous trunk, a phenomenon very obvious against the pale disc, but not seen in the branches.

(*d*) Pathogeny of post-haemorrhagic atrophy. The ninth day from the accident, when an ophthalmoscopic examination was made, she was examined sitting up and lying down, and a marked difference was noted in the figures of the blood pressure, the lowest figure being the vertical one, while the level of the diastolic arterial pressure was then so low as to border on that of the ocular tension ; in other words, the blood column seemed to have scarcely enough force to reach the eyeball. There was in the case first syncope, then blindness and deafness. Consciousness came back first, then hearing, and last of all and only partially, sight. Magitot traces this to the calibre of the different trunks to these

various organs, while the auricular artery is closer to the basilar than the central artery is to the carotid. Thus, as in quinine poisoning, the blindness and optic atrophy here are due to the ischaemia of the third retinal neuron, the ganglion cells, whose death or destruction entails that of their axis cylinders, which form the optic fibres.

(*e*) The present observation leads to therapeutic conclusions. If the head had been kept very low at the start irreparable anatomical lesions of the nerves might have been avoided, while Magitot suggests the possibility of the Trendelenburg position being helpful, with injections of serum or of adrenalin to help the vaso-motor mechanism and raise the blood pressure.

W. C. SOUTER.

III—PAPILLOMA OF THE CORNEA

Garraghan, Edward F., A.M., M.D. (Chicago, Illinois).—Papilloma of the cornea. *Amer. Jl. of Ophthal.*, Vol. IV, No. 10. October 1921.

Garraghan publishes a note on a case of papillomatous growth of the cornea, the rarity of tumours of this kind and their tendency to recur lending special interest to the case.

The macroscopic appearance was that of an extensive granular tumour, like a raspberry, which was firmly attached to the corneo-scleral margin, and lying rather freely upon the eyeball. Only a small section of the iris and pupil was visible, and a probe could be passed beneath the tumour all round the cornea and conjunctiva, except at the region of several blood-vessels which passed from the centre of the tumour through the substance of the conjunctiva to the inner angle of the eye. The tumour bled easily on manipulation.

Microscopic examination: the pathological report was to the effect that the tumour was a papilloma with mild secondary inflammatory reaction.

The tumour was removed, and the cornea began to clear, the conjunctiva of the bulb being entirely free of the tumour. In two weeks, however, there was recurrence over the cornea, and two large vessels were seen to pass from the tumour into the conjunctiva. These vessels were ligatured and the tumour cauterized as at the first operation. Slight recurrence took place on several later occasions, and cauterization was employed, the last occasion being fairly recent, so that complete cure cannot be said to have been achieved.

The author gives a short historical survey of epibulbar tumours, the majority of which originate in the corneo-scleral margin, or conjunctiva, and spread until they involve the cornea.

The tendency of these tumours is to become malignant, a feature which should always be borne in mind. A coloured plate gives a good illustration of the macroscopic appearances before operation.

J. HAMILTON MCILROY.

IV—NON-SURGICAL TREATMENT OF MALIGNANT EPIBULBAR NEOPLASMS

Heckel, Edward B. (Pittsburg). — Non-surgical treatment of malignant epibulbar neoplasms. *Arch. of Ophth.*, March, 1922.

Heckel reports two cases of malignant epibulbar neoplasms cured by X-rays. The material facts are as follows:—

Patient, aged 71 years, whose right eye had been affected for about one year. A small piece of the neoplasm was examined microscopically and the portion nearest the cornea contained several outgrowths with well-developed epithelial pearls. The diagnosis of epidermoid carcinoma was made. Seven exposures to X-rays extending over 35 days were made. In the result complete cure was obtained.

A patient, aged 61 years, whose right eye had been affected for about six months. The neoplasm was found to be a squamous-celled carcinoma. The case was exposed to X-rays on twelve occasions, spread over a period of seventy days. The result was successful.

Heckel remarks that the principal commandment of the cancer decalogue is, "do not cut across a cancer and leave a part behind. The part remaining will grow more rapidly than if it had been let alone altogether." As regards technique, the face is covered with a piece of tinfoil, perforated with a small hole a little larger than the neoplasm, and so placed that when the patient is told to look in a certain direction the hole is directly over the neoplasm.

Where the neoplasm projects through the lid aperture as a cauliflower growth, it is well to excise the protruding mass and then to follow this immediately with the Röntgen ray or radium.

S. S.

V—REMEDIES

(1) Zimmermann, Charles (Milwaukee, Wisconsin).—Parenteral injections of milk in diseases of the eye. *Amer. Jl. of Ophthal.*, January, 1921, p. 18.

(1) **Zimmermann** gives a short survey of the therapeutics of milk injections, with a critical review of the results of various workers, and a report of two cases of his own.

He describes the technique and the general reaction of parenteral injections, but points out that the mode of action is not yet sufficiently known. High temperature appears to have a helpful influence upon the course of localised affections, in support of which view the author instances the improvement of trachoma in an epidemic of scarlet fever among 40 children. Whether this is due to the high temperature acting deleteriously upon the micro-organisms, or to leucocytosis, or to hyperaemia and transudation at the site of local inflammation is a matter of theory at present.

Zimmermann quotes favourable results from milk injections on the part of Berneaud of Kiel, Maschler, Jickeli, etc., and doubtful or negative results on the part of many others.

His own cases (phlyctenular kerato-conjunctivitis with pronounced strumous diathesis) showed very gratifying results from single injections. He sterilized the milk for 10 minutes previous to injection into the gluteal region.

J. HAMILTON MCILROY.

(2) Bussy, L., and Japiot, P. (Lyon).—Radiotherapy in interstitial keratitis. (La radiothérapie dans la kératite interstitielle.) *La Clin. Ophtal.*, February, 1921.

(2) In a very moderately worded article **Bussy** and **Japiot** relate their experience with very small doses of X-rays in the treatment of interstitial keratitis. The following is a summary of the paper:—Up till now radiotherapy has not been systematically tried in interstitial keratitis. Yet this is a disease in which it is specially indicated because it is chronic, because it is characterized, in the beginning, by infiltration between the corneal lamellae of young connective tissue cells which are radio-sensitive, and that without severe lesion of the corneal tissue. Experience justified the above hypothesis. To be efficacious the treatment must be begun during the period of infiltration, before cicatricial changes have been caused. The younger the patient, and the more the disease is of the inflammatory type, the more favourable are the results. The hereditary syphilitic forms are the most amenable to the treatment. In strumous children the results are less favourable. The method employed by the authors is to depend

on what they themselves describe as homoeopathic doses. Such doses, where only penetrating rays are used, do not necessitate terrifying apparatus to protect the skin and parts of the eye not under treatment, such as would otherwise be necessary in young children whose growing cells are very radio-sensitive. The authors apply to the closed eye, without special localisation or protection, very small doses of penetrating rays during five *séances* of five minutes each, the *séances* being separated by a week. It is probable that these radiations act by mobilizing rather than by destroying the cells. The method should be used in conjunction with the ordinary methods, not as a substitute for these. "It causes a very rapid quietening of subjective phenomena, such as pain, photophobia and blepharospasm. It may considerably shorten the duration of the disease and that, especially, at the expense of the stage of vascularization. Finally, if employed early, it leads to an absorption of the infiltrates and clearing of the cornea in a manner which does not seem to occur with any other method."

ERNEST THOMSON.

BOOK NOTICES

Ophthalmological Society of Egypt. *Bulletin* of 1921. Cairo: 1921.

This volume of 79 pages includes the proceedings of the eighteenth annual meeting held on March 4, 1921, in the Pathological Museum of the Kasr el Ainy Medical School. The first 40 pages of the report are occupied with the discussion on the prophylaxis of trachoma and the various forms of ophthalmia, a sequel to the appointing of the Committee in March, 1920, to study and report on the subject. This discussion has been touched upon this year in these columns (page 126). Since that note was written S. C. Hebard, Senior Inspector of the Ministry of Education, has protested against the report of the Committee. He points out that the Committee has not taken steps to ascertain the medical work actually done in Government Schools, and recommends methods of medical inspection which were in operation long before the Ophthalmological Society of Egypt existed. In point of fact, the Government Schools have been medically inspected since 1864. Hebard objects also to the Committee's recommendation that the Ministry should be advised to appoint an adequate number of medical officers who have previously had a short training in ophthalmology. With one exception all the doctors in the service of the Ministry have been trained in ophthalmology,

and one of them is an eye specialist. The Ministry insists on training in ophthalmology as an essential qualification for the post of school medical officer. Of the three lady medical officers two have had specific training in ophthalmology. More recently medical inspection has been extended to private elementary schools receiving grants in aid, and it is intended ultimately to examine all schools of this kind.

Apart from this the volume contains a good description of the sclero-corneal junction by Dr. Sohbi Bey illustrated by three coloured plates. Dr. Zacharia Matta, in the course of some notes on blepharitis, has found the specific cause of blepharitis, the Morax bacillus in the nose and throat of such cases. Another proof of the intimate connection is the improvement of the conditions of the lids on applying active treatment of the nose and throat together with local treatment of the lids. For tonsillectomy (which is not in the domains of the ophthalmologist) can be substituted the prolonged painting with tincture of iodine.

The nose can be douched with lotions and then smeared as far as it can be reached with zinc sulphate or yellow ointment. Dr. Girgis's paper on retinal haemorrhage after non-perforating injuries to the globe is illustrated with three coloured plates. Girgis has treated nine cases of glaucoma with a successful result, in six by iridotomy.

The remainder of the volume is occupied by various cases, some printed in English and others in French.

The book is now carefully edited and the abbreviations recommended to members do not lose in value through the acknowledgment of their sources.

S. S.

Eyes and Spectacles. By Dr. M. VON ROHR. Authorised Translation by A. HAROLD LEVY, F.R.C.S. London: The Hatton Press, Ltd. 130 pp. Price, 6s.

In the preface the author modestly says: "if this book will contribute, however slightly, to the knowledge of the problems associated with spectacles it will have afforded sufficient reason for its appearance." He has stated most of the problems clearly and well, but no help is given to the ophthalmic surgeon for the prescription of spectacles which will overcome the troubles of which the patient complains.

Dr. Rohr is a good mathematician and is a recognized authority throughout the world on optics, but he is not a doctor of medicine, and it is unfortunate that he has not told us more of what he so well knows. There are several gross ophthalmological blunders, for which his informants are to blame; for instance on p. 10, "by a simple calculation, neglecting spherical aberration, an axially

myopic eye of −13.25 D. is, after the operation of removing the lens, found to see clearly at a distance." It has well been known by all of us for the last twenty-six years that the axial myopia must extend to −25 D. for this result to follow. Dr. Rohr's mathematical result is based, like his faulty table on p. 9 of the relation between axial length and myopia, on Professor Gullstrand's evaluation of the constants for the eye. Professor Tscherning's constants are far more reliable and are borne out by all practical experience. Dr. Rohr has not been told the correct diameter of a foveal cone, nor does he seem to be aware of the fact that in order to see two objects apart by cone vision it is necessary to have at least one unstimulated cone between them. He gives Donders' table of the variation of accommodation with age, making no allusion to Duane's invaluable work on the subject. The subject of bifocal lenses is very inadequately treated, nothing whatever is said about the correct centring of the reading segments, though we all know the discomfort induced in cases of anisometropia from neglect of this point. Illustrations are given of telescopic spectacles for myopes, but no information is afforded how they are prescribed by the ophthalmic surgeon. Dr. Rohr could easily have given us a formula for this prescription, but for this, as for all other practical purposes, the book leaves much to be desired.

A. P.

Glaucoma and Hypotony (Glaucome et Hypotonie.) By Professor FELIX LAGRANGE, pp. xvi. 432, 104 figures in text; 6 plates; 4 in colour. Paris: Libraire Octave Doin, 8, Place de l'Odéon. 1922.

Lagrange, in this large and interesting book, expounds his theory of glaucoma and hypotony, and discusses their appropriate treatment. The first chapter, on the nature of glaucoma, is nearly 120 pages long. He lays stress on a point that is often forgotten, that glaucoma is generally not merely a local disease, but an ocular disease occurring in an already diseased organism. "We may divide," he says, "the subjects of glaucoma into three groups: (a) the neuropathics, whose sympathetic vaso-motor systems are the scene of abnormal crises, capable of causing a sudden access of congestion of the eye, by means of a sudden intraocular transudation, which cannot be dealt with sufficiently rapidly by normal excretory passages: (b) those patients whose circulatory system is defective, and who have in consequence abnormal hypertension; in these, all the vessels—not excluding the ocular vessels—are sclerosed. The loss of elasticity of the vessel walls interferes with the free circulation. (c) The third group has both diseased vessels and abnormal nervous systems." It is these neuropathic subjects who

give the surgeon most anxiety and trouble. Their tension is never constant; it may be normal at one moment and +2 at the next; they are the most likely candidates for the worst complications.

"Sometimes the surgeon may find an eye," says Lagrange, "which is practically an erectile organ capable of sudden turgescence; even after the incision and iridectomy, at the moment of the toilette of the wound, such an eye may become quite hard, as if the vitreous had suddenly swollen to an abnormal size. The surgeon can feel, in a way, the eye swelling under his finger."

The neuropathics are specially liable to trophic disturbance of the nerve leading to atrophy, even after the pressure is relieved.

In the section on the causation of glaucoma, and under the head of hypersecretion, he quotes the experiments of Bonnefon to show that the intraocular tension is not directly dependent on the vascular content, but that the principal factor is the total liquid content of of the eye. This can be reduced by continued pressure; when the pressure is removed, the content is renewed comparatively slowly; a vascular congestion is the immediate consequence of the removal of pressure.

In the section dealing with the various operations for glaucoma, he insists, with justice, that he was the first to secure a filtering scar, without inclusion of iris, by means of his limbal sclerectomy; and claims with equal justice, that all forms of limbal sclerectomy, by whatever instrument performed, are at bottom variations of the sclerectomy of Lagrange. He seems to fear that English ophthalmologists will concede this unwillingly, and returns again and again to this point.

There can be no doubt about the priority; Lagrange's first communications were published in 1905, in the *Comptes rendus de la Société de Médecine de Bordeaux* (June), and in the *Comptes rendus de l'Association française de Chirurgie* (October), and though ophthalmologists elsewhere might be pardoned for missing these papers, they could hardly fail to see the account of his work in the volume of *Archives d'Ophtalmologie* for 1906.

Herbert's first sclerectomy seems to date to the end of 1906, and the work of Fergus and Elliot is three years later.

Lagrange compares the various methods, including sclerectomy by trephining, and decides that his own method is the best and most certain to secure a wound suitable for forming a fistulous scar, on the following grounds:—Any operation aiming at fistulisation must attack the sclera and the sclera only. If the wound interests the cornea, this membrane is so active in throwing out new tissues to heal the breach, that the wound will probably be soon blocked and filtration will cease. Loss of substance of the sclera is repaired very slowly, if at all. But if the wound must not enter the cornea, neither must it encroach on the ciliary region. Injury, however

slight, of the ciliary body, is often followed by most serious disturbance of the whole eye.

To guard against late infection the wound must have a covering of the whole thickness of the conjunctiva.

He decides, from an anatomical study of the filtration angle, that to fulfil these aims, the part excised must be about 2 mm. long and not more than 1 mm. high; and that the excision can best be made, after an incision with a linear knife, by means of scissors or, as Holth advises, by a punch.

He claims that his operation is almost faultless and devoid of risk; "nulle opération n'est plus innocente que ma selerectomie" (p. 344). Those operators who have found it dangerous have used it in cases for which it is not suitable, such as acute glaucoma.

He has never known late infection, never iritis. He concludes that to select the trephine is to court disaster.

It may be suggested that Lagrange is hardly fair to the trephine; few English operators try to cut the whole round of the trephine crown, but intentionally weigh more heavily on the anterior part of the edge and leave undivided the posterior quarter of the circle; when they cut off the crown they leave the hinge behind, and the resulting opening has much the shape which Lagrange recommends, 2 mm. long and 1 mm. high.

We may be permitted to doubt, also, whether in the primary incision Professor Lagrange is always able to graze the surface of the iris and divide the tendon of the ciliary muscle without injuring the ciliary body (p. 209). Treacher Collins has pointed out that the section for iridectomy in glaucoma has never been seen by him to lie outside the canal of Schlemm. Lagrange's section must lie far outside this.

The second condition, Hypotony, is dealt with in the last 70 pages; it is a condition which has not attracted so much interest as glaucoma; the immediate sequel is not so striking or, perhaps, so dangerous.

As is glaucoma, hypotony is generally an ocular condition in an abnormal subject, and may be caused by hyposecretion, or perhaps by hyperexcretion. On the other hand, in a healthy subject, it may follow a slight injury to the ciliary body.

In view of the association between hypotony and detachment of the retina, on the one hand, and progressive myopia, on the other, it is desirable to try to find some means of raising the tension in hypotonous eyes, either by improving the secretion or checking the excretion of the contained fluid.

Whether the contraction of the vitreous, or its liquefaction, is the immediate effective cause of retinal detachment, both are likely to be benefited by holding back the fluid in the eye.

Surgeons have tried to raise the tension, experimentally, by

blocking the filtration angle. But this form of treatment is manifestly too dangerous for other than experimental work; Lagrange thinks that the escape can be sufficiently limited by encouraging the formation of a band of fibrous tissue on the outside of the sclerotic, round about the region of the filtration angle. If the escape is limited, the tension will rise. Certain cases have been observed by Kummel, Guarino, and Lagrange himself in which glaucoma has followed on extensive scarring of the conjunctiva.

Guardino is quoted as expressing the opinion that the high frequency of glaucoma in Egypt is due to the cicatricial state of the limbal conjunctiva in old trachoma.

Lagrange adopts a measure which he calls colmatage; it consists in burning the sclerotic deeply, through the conjunctiva, in a number of points—20 or more—arranged in three rows round one half of the limbus; later, if necessary, the other half is treated similarly. This is followed by a series of subconjunctival injections.

He produces the notes of a number of cases in which detachment of the retina was cured by these means.

As a means of treatment of this disastrous condition, anything that will allow us to raise the intraocular tension deliberately, and to a definite extent, holds out large hopes.

The book as a whole is interesting and stimulating; there is much that is controversial in it—some of this has been indicated here—but no one can doubt the sincerity of the author or deny the great debt which the world owes him for his operation of limbal sclerectomy as a means of combating chronic glaucoma.

The book loses from the absence of an index.

HAROLD GRIMSDALE.

CORRESPONDENCE

VENOUS PULSATION

To the Editor of THE BRITISH JOURNAL OF OPHTHALMOLOGY

SIR,—I am unaware whether it is on record that in the majority of cases of physiological retinal venous pulsation—as far as I have gathered from observation on about a dozen cases—the pulsation ceases when the eye is turned to the extreme lateral limit in either direction. The direct view of the disc under such circumstances is

the more easily secured with a self-luminous ophthalmoscope, for the obvious reason that the observer is thereby independent of picking up the light at a difficult angle.

Yours truly,

BASIL GRAVES.

February 9, 1922.

COLLOSOL ARGENTUM (FOR THE MEDICAL PROFESSION ONLY)

To the Editor of THE BRITISH JOURNAL OF OPHTHALMOLOGY

SIR,—It was with great surprise that I read in the letter of Mr. M. S. Mayou in the April number of the journal, that he found the use of collosol argentum causes pain and irritation.

I have continued to use it ever since I wrote my article on the treatment of ulcer of the cornea and interstitial keratitis in some 40 to 50 cases daily.

As regards the pain, I have had only one complaint and that was from a neurotic old lady with ulcer of the cornea. Subsequently she had several relapses and made no complaint.

It is obvious that a considerable proportion of the above cases would be children, therefore exceedingly apt to resent anything of the kind.

The formula I use is 12 minims of sol. of scopolamine 1 in 800 to two drachms of collosol argentum dropped into the eye five times a day and the eye kept closed for five minutes afterwards.

If this is not sufficient to keep the pupil dilated a separate supply of the mydriatic is given.

As regards the irritation mentioned, I have never met any. In ophthalmia neonatorum it is used as supplied. It must be somewhat difficult to determine as to whether or not it causes pain in an infant, especially when combined with other treatment as recommended by me.

Possibly the method of its use may account for this great discrepancy.

For some time during the war and after, I found it to vary in colour from light sherry colour to almost black; recently it has been more uniform. I have never been able to get a satisfactory explanation as to why it should have been so.

I am, Sir, Yours faithfully,

A. LEGGE ROE.

HULL, *April* 3, 1922.

NOTES

Deaths

WE regret to announce the death, at the age of seventy years, after a long and painful illness, of Dr. Duboys de la Vigerie, ex-chef de clinique of the Clinique National des Quinze-Vingts and general secretary of the Société française d'Ophtalmologie. He received the Croix of the Légion d'Honneur through the unanimous request of his colleagues, by reason of his eminent services to science, and particularly to ophthalmology.

It is also with regret that we record the death of Dr. Charles Pinkerton, which took place suddenly at Hastings, in his sixty-eighth year. He was once surgeon to the Southport Eye, Ear and Throat Hospital, and on his retirement was elected consulting surgeon.

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Appointments

W. T. GRAY CLEGG has been appointed University Lecturer in Ophthalmology at Manchester, and H. Horsman McNabb and John Wharton have been made Lecturers in Clinical Ophthalmology. A. E. J. Lister, Lieut.-Colonel, I.M.S. (retired), has been appointed Assistant Surgeon to the Western Ophthalmic Hospital, London, and Dr. Inglis Pollock, Surgeon to the Glasgow Eye Infirmary.

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Professor Van Duyse

THE Belgian Society of Ophthalmology, at its last meeting at Ghent, celebrated its twenty-fifth birthday, and at the same time presented, through Dr. Gallemaerts, an address to Professor van Duyse, general secretary of the Society since its foundation. He has also received the title of Commander of the Order of the Crown of Belgium.

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The Optical Society

AT the June meeting of the Optical Society a group of papers dealing with spectacle construction will be presented. The papers will be followed by a general discussion, in which it is hoped both ophthalmologists and opticians will take part. Anyone desiring to submit a paper on this subject or otherwise to contribute to the discussion, is requested to communicate with the Joint Honorary Secretary of the Society, Mr. F. F. S. Bryson, Glass Research Association, 50, Bedford Square, W.C.1.

Central London Ophthalmic Hospital

THE Central London Ophthalmic Hospital Past and Present Students' Dinner will be held at the Trocadero Restaurant on Thursday, June 8.

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Brighton and the Blind

THE Brighton Town Council has adopted a scheme for the exercise of the powers conferred on the council under the Blind Persons Act, 1920, and has voted a grant of £100 to the local Blind Relief and Visiting Society. The object of the scheme is to keep in touch with babies born blind or with defective sight, and in the case where the home is unsuitable and where the infant is not developing properly, there is provision for the infant being sent to the National Institute's Home for Blind Babies. Provision is also made for children of school age, for the teaching of basket-making, chair-caning, etc., after school hours, and for the marketing of goods.

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"British Journal of Ophthalmology"

THE Publishers have reserved a limited number of complete sets of the first five volumes of THE BRITISH JOURNAL OF OPHTHALMOLOGY for readers who wish to have a complete set of the Journal from the start. They are to be sold unbound at the price of nine guineas the set of five volumes.

They are also prepared to supply, to a limited extent, single volumes at the price of two guineas each.

Application for these should be made to the Manager, BRITISH JOURNAL OF OPHTHALMOLOGY, c/o Messrs. Geo. Pulman & Sons, Ltd., 24, Thayer Street, W.